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(54) INNER BASS REFLEX

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(51)<sup>4</sup> H04R 9/06 H04R 7/12

(57) Claim A dynamic moving coil loudspeaker comprising a magnet, a cone, and a voice coil, characterised in that: an axial opening passes through the magnet and the cone, which hole is extended by an open pipe which prevents the drop of air pressure at the front, and ensures the right phase of sound wave, that passes through the said hole from the back to the front between the fins of an inner cylinder located in the said hole, which takes over the heat generated in the voice coil from the magnet and delivers it to the passing air stream.

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Form 10A

PATENTS ACT 1952

# PETTY PATENT SPECIFICATION

(ORIGINAL)

TO BE COMPLETED BY APPLICANT

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ACTUAL INVENTOR

RADOVAN ROY ZUNIC

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and is correct for printing.

30:4:85

ADDRESS FOR SERVICE

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Petty Patent Specification for the invention entitled:

INNER BASS REFLEX

The following statement is a full description of this invention, including the best method of performing it known to me:—

\* Note: The description is to be typed in double spacing, pica type face, on 30 lines not exceeding 230 mm in length and 160 mm in width, on tough white paper of good quality and it is to be inserted inside this form.

This invention relates to improvements in the low frequency unit speaker.

It is a well known fact that conversion efficiency, percentage of electrical input from audio amplifier available as acoustic output from speaker as transducer is very low. This problem is partially solved by using a bass reflex principle permitting sound from the rear side of the speaker cone to be radiated to the front. But from the other side that complicates the making of speaker box because of bass reflex tube  
10 which also encreases the distortions because of unequal air pressure at the rear of the speaker cone. The second problem is power handling ability which mostly depends on speaker ability to transfer heat produced in the voice coil to the magnet and out.

It is the object of the innovation to overcome those problems which are described below with the reference to the accompanying drawings in which:

Figure 1 is cross section of the ordinary speaker

Figure 2 is cross section of the speaker with inner  
20 bass reflex

Figure 3 is front view of inner cylinder with fins.

Speaker consists of cone (2), centre (3), cone surround (4) of compliant material fitted to periphery of loud-speaker cone to seal it to the frame (1) yet permitting axial movement. A wire coil (5) attached to the speaker cone, placed in the field of magnet (6) moving the speaker cone back and forth in accordance with the frequency and intensity of signal from amplifier.

So far the construction and principle of work are similar to the speaker previously in use (shown at fig. 1) and  
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the difference in details described further constitute the improvements as shown at fig.2.

The main difference is a hole through the centre of the whole construction: magnet (6) and cone (2). This hole and pipe (7) are the central features of the system called "Inner bass reflex" and this is how it works:

10 The voice coil driven by electrical signal from amplifier moves speaker cone forward. This movement creates air pressure, sound wave at the front of cone. Pipe (7) made of convenient material (cardboard, plastic etc) is elevated from the bottom of the cone to prevent fall of air pressure at the front. This can be realized in two ways: by fitting pipe on the magnet permitting free cone movement around it as on fig. 2. or by fitting a pipe on the bottom of the cone so that they would move together. In the first case the mass of the cone is lower, but there is some fall of air pressure through the gap between the cone and the pipe. In the second case the mass of the cone is increased but there is no gap between the cone and the pipe.

20 When the cone moves back it creates air pressure inside speaker box. A bass reflex tube (8) at the back of the magnet enables air pressure inside the speaker box to be radiated through the magnet and the pipe at the front ensuring the right phase between sound waves from the front and the rear of the speaker cone.

Such construction increases the efficiency of the unit making good use of the air pressure from the rear of the cone (bass reflex principle) together with decreasing of distortion because the air pressure at the rear of the cone is now quite symmetrical.

30 Inner cylinder (9) with fins (10) shown at fig. 3

that is placed inside the magnet has a double purpose: to compensate for reduction of strength of the magnet because of a hole through it and as it is in close contact with magnet takes over the heat which is produced in voice coil and delivers it to the air stream which passes between fins, because of the difference of the air pressure inside and outside of speaker box, increasing the speaker power handling ability.

INT OFFICE

The claim defining the invention is as follows : .....

"A dynamic moving coil loudspeaker comprising a magnet, cone, and a voice coil, characterised in that: an axial opening passes through the magnet and the cone, which hole is extended by an open pipe which prevents the drop of air pressure at the front, and ensures the right phase of sound wave, that passes through the said hole from the back to the front between the fins of an inner cylinder located in the said hole, which takes over the heat generated in the voice coil from the magnet and delivers it to the passing air stream.

Dated this 16th day of January, 19 85 RADOVAN ROY ZUNIC  
NAME OF APPLICANT  
(Block Letters)

\*Note : If there is insufficient space above to type the statement of claim, do not use this sheet, but use as many sheets of paper beginning with the words "The claim defining the invention is as follows:" and ending with the date and the name of the applicant in block letters.

Fig. 1

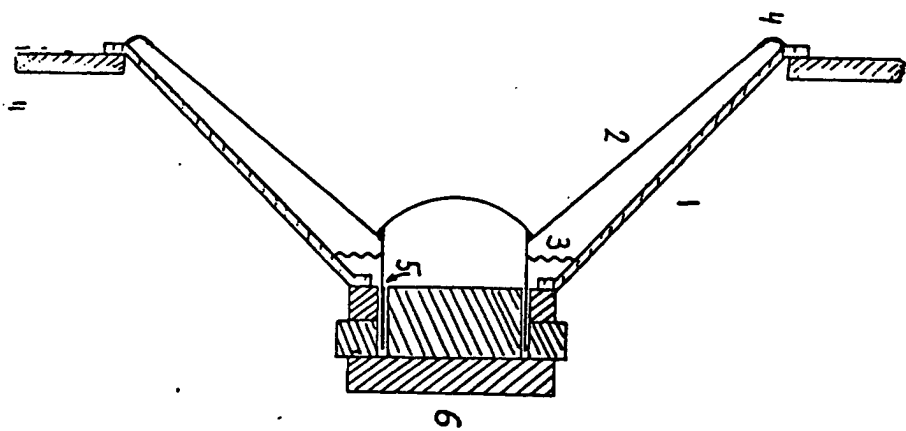


Fig. 2

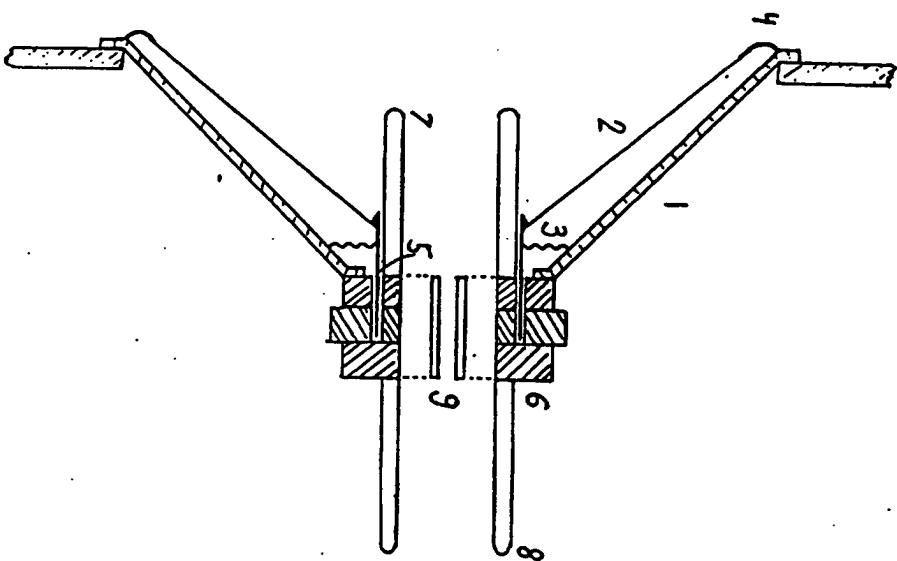


Fig. 3

